

A Growing Concern

A Golf Course Architect's View of Tree Placement on the Course

By TAMARA HORVATH
with Craig Schreiner

Americans love golf because it's fun and because it provides exercise in the open air for souls who live in the city. At least we love it when we're at our best. But what if the ball lands behind a tree? What if you can't take a full swing with your iron because of hanging limbs where you've sliced it into the rough? What if the ball lands under a thick evergreen planted close to the fairway and you can't find it under the lower boughs?

Trees are a vital part of the golf course environment. They produce oxygen, filter air, shelter wildlife and reduce noise, temperature and glare. Trees also provide obvious safety benefits. Many times trees are added to compensate for inadequately designed golf holes. Although they offer many benefits, trees can also cause problems when they are not properly selected or when their purpose and placement are not considered.

When you consider planting trees on your course, remember that golf is a sport played through the air, but on the ground. Many times people see a void and want to put a tree there. Most people don't realize how the placement of a single tree can adversely affect the golf hole — there's a price to pay for improper tree placement. Tree placement shouldn't hinder Integrated Pest Management (IPM), but rather complement the course with screening, definition, shade, majestic beauty and safety in the right places.

Tree Placement on the Course

Some locations on the course are more appropriate for trees than others. Trees left or planted in strategic locations add aesthetic value. Improperly placed trees disturb the harmony of the setting. Here are a few things to keep in mind about proper tree placement:

How it Affects the Game

The architect should give careful attention to positioning trees "through the green." Ball impact on a tree can cause permanent scarring of cambium tissue and bark. Damaged trees are more likely to be infected by insects and diseases. And it's impossible to hit out from under trees.

Placing trees behind and beside the green can enhance a player's perspective of the green's location and pin placement on a blind approach shot. Such placement can also screen distracting off-site views and frame the green.

Tree placement within the fairway should be done sparingly because trees are penal. Large trees can get in the way of a shot. Players must make shots that either clear or circumvent trees in the fairway. The architecture of the course directly correlates to the size and location of fairway trees. When trees are designed within the fairway, there must be enough area for alternate routing. The impact zone or landing area of a golf course is typically located 180 yards to 280 yards from the tee.

When thinking about fairway widths at alternate routings and when design-

ing around specimen trees, there must be room to work outside the tree's drip line, and widths must be increased by the width of the tree's mature reach.

Also, canopy height appropriate for a fairway depends on the sequence of shots made to play the hole. It's desirable to have a tall canopy with highly pruned branching for tree placement just beyond the approach shot to the green. Trees with somewhat lower canopies may exist from 220 yards to 260 yards out, where the impact zone is typically located.

Trees within the rough are acceptable to the professional golfer, tolerated by the average player and menacing the duffer. Areas within the rough need to have turf mown higher underneath large shade trees to allow the grass more surface area for photosynthesis. Historically on seaside links, the rough areas include taller native grasses and sand dune species. Sensitive golf course architecture includes topographic contouring and shaping that allows the golf ball to be played around a tree toward the green, increasing the options of playability.

The widest variety of tree types may be planted in the out-of-play area surrounding the tee. Trees surrounding the tee should provide safety, frame the area and direct play. They are in high-focus areas on the course in close proximity to players waiting to hit their next shots. This is when shade, shape, texture and color are most apt to be noticed. Most golf courses have holes where play slows during tournaments

(Continued on Page 25)

Dense trees

These trees are well suited for screening winds and views, as well as for establishing golf course boundaries.

<i>Abies balsamea</i>	Balsam fir
<i>Abies concolor</i>	White fir
<i>Abies fraseri</i>	Fraser fir
<i>Abies procera</i>	Noble fir
<i>Abies veitchii</i>	Veitch fir
<i>Cedrus atlantica</i> 'Glauca'	Atlas blue cedar
<i>Cedrus deodara</i>	Cedar
<i>Cedrus libani</i>	Cedar of Lebanon
<i>Chamaecyparis</i> sp.	Cypress
<i>Cryptomeria japonica</i>	Japanese cryptomeria
<i>Cunninghamia lanceolata</i>	Common China fir
<i>Cupressus arizonica</i>	Arizona cypress
<i>Cupressus sempervirens</i> 'Glauca'	Blue Italian cypress
<i>Fagus sylvatica sanguinea</i>	European beech
<i>Fagus sylvatica</i> 'Tricolor'	Tricolor beech
<i>Juniperus</i> spp.	Upright junipers
<i>Magnolia grandiflora</i>	Southern magnolia
<i>Picea abies</i>	White spruce
<i>Picea glauca</i> 'Caerulea'	Spruce
<i>Picea glauca</i> 'Densata'	Black Hills spruce
<i>Picea likiangensis purpurea</i>	Likiangensis spruce
<i>Picea pungens glauca</i>	Colorado blue spruce
<i>Pinus banksiana</i>	Banksiana pine
<i>Pinus densiflora</i>	Japanese red pine
<i>Pinus densiflora</i> 'Umbraculifera'	Japanese umbrella pine
<i>Pinus elliotii</i>	Slash pine
<i>Pinus flexilis</i>	Pine
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Pinus sylvestris</i>	Scots pine
<i>Pinus thunbergii</i>	Japanese black pine
<i>Pinus strobus</i>	Eastern white pine
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Taxus baccata</i>	English yew
<i>Taxus cuspidata</i> 'Capitata'	Japanese yew
<i>Taxus cuspidata</i> 'Densiflora'	Densiflora yew
<i>Thuja occidentalis</i> 'Techny'	Mission arborvitae
<i>Thuja orientalis</i> 'Aurea Nana'	Berkman's golden arborvitae
<i>Tsuga canadensis</i>	Canadian hemlock

Trees—

(Continued from Page 23)

or high-traffic days. A nicely landscaped tee with partial shade for players waiting to hit their balls will be appreciated.

How It Affects the Turf

Allowing the turf to receive more sunlight by removing improperly placed trees and thinning selected tree canopies improves the overall vigor of the turfgrass. Also, competition from tree roots for water and essential nutrients reduces the turf's ability to counter stress during peak play periods.

Air circulation plays a major role in turfgrass health. Turfgrass that must endure stale air is subject to common diseases that cause headaches for superintendents. Ideally (for turf health), trees shouldn't be planted closer than 60 or 70 feet from the green. Creating better air circulation is especially necessary when the green is at or near the bottom of a hill. Removing, thinning and pruning trees can improve air circulation and thus reduce the chemicals (and

(Continued on Page 27)



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Trees—

(Continued from Page 25)

amount of money) necessary to combat diseases. On the other hand, trees on elevated points of the golf course can create a windbreak that keeps a green from drying out too rapidly.

The golf course tee should receive about six to eight hours of sunlight daily to support healthy turf. The tee should receive morning sun to allow leaf blades to dry and afternoon shade to cool the grass and soil. Trees should be located on the west or north sides of the tee. Trees to the east and south of the tee area should be at least 50 to 60 feet away.

Planting Too Close

Trees inhibit air circulation, which leads to fungal and disease problems during the summer heat because the grass blades can't properly dry out from overnight moisture or high humidity. Problems will arise if the green doesn't receive sunlight before 10 a.m. Also, excessive heat builds in the late morning and early afternoon, when prevailing air movement is blocked by trees. More irrigation and chemicals are necessary to compensate for this lack of natural air movement.

To completely avoid such problems, trees shouldn't be planted less than 60 or 70 feet from the edge of the green. This will prevent limbs from hanging over the green, prevent feeder roots from competing with the turfgrass when the tree reaches maturity and prevent the mature tree from blocking air circulation and sunlight. Of course, few golf courses maintain this ideal distance between trees and greens.

Tree Selection by Type

It's important to select trees according to desired shape and appropriate size for the location. Improper placement of certain tree types can adversely affect playability. The best choices for areas of play are large deciduous shade trees with upright branching habits. These tree types facilitate play more than lower-branched trees by allowing adequate room to play the ball around and under the canopy.

Trees that can adversely affect play include evergreens and small ornament-

als. Evergreens' density and low-branching habit can hinder playability. Evergreen trees should be planted in locations where marking boundaries or screening is either necessary or beneficial. Hanging limbs can impede the golfer's swing and clean execution of a stroke. However, there's no penalty if a player's club touches the limb of a tree. Most ornamental trees are too small and delicate to survive in areas of play. These tree types should be planted in locations well away from the centerline of play to ensure longevity.

The course should have a planting design that allows trees to grow free from the impetuous pounding of golf balls. During master planning, each

(Continued on Page 29)

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Trees—

(Continued from Page 27)

hole should be carefully studied in terms of the angle of the tee, topography of the course, locations of greens, solar orientation and prevailing wind. The practice facility or driving range should be built at such an angle that landscape plants won't suffer damage from frequent golf-ball impact.

Basic Tree Selection

Besides obvious aesthetic value, trees should always be hardy enough for the area. Hardiness can be determined by the USDA Hardiness Zone Map of climatic variations. Local nurseries and garden centers should carry plants that will survive winters in your area.

For large-scale planting, order trees wholesale through brokers and nurseries. Your local Extension Service should have information that will verify whether a particular tree type will perform within your climate zone.

The rate of growth is particularly important. In some cases, a fast-growing species may be chosen for quick establishment to impede high wind and develop definition. These types serve a temporary function in the landscape, but because they are short-lived, they must be replaced eventually by slower-maturing varieties. The planting of slower-growing trees is more common in areas where longevity has importance. Such areas on the golf course include the high-visibility areas around the clubhouse, tees, greens and landing areas.

Shade on the Golf Course

The next time you pass a sod farm that has beautiful, dense swards of turfgrass, count the trees growing in the field. Golf course superintendents know only too well that trees with dense canopies cause too much shade and prohibit healthy turfgrass. The grass plant should receive enough sunlight to adequately photosynthesize, especially in the morning.

Trees' leaf size and composition affect the amount of light that dapples through their canopies and reaches the grass below. The ideal trees for golf courses produce filtered light, letting some degree of sunlight through its canopy.

Selection of the grass species appropriate for certain areas on the golf course is very important. Fine fescue has been a standard cool-season grass grown under shady conditions. Warm-season grasses must have a great deal of sun to thrive.

Relatively few grasses bred for shade tolerance can withstand wear. The turfgrass on the course must also withstand the stress caused by golf cars, mowing equipment and players. Above all, grass needs sunlight to promote healthy, vigorous roots, crowns, stolons or rhizomes for growth.

Balance is the key to success, however, since shade may be beneficial in other areas. For example, trees that produce shade in non-irrigated roughs keep the soil cooler.

How many times has a golf course superintendent left a green committee meeting after another veto of tree

(Continued on Page 31)

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Trees—

(Continued from Page 29)

removal from a green, when he or she is asked by a committee member who voted to save the tree: "Say, I have a lot of shade in my backyard and I can't seem to keep grass growing on it. What type of grass seed should I use?"

Trees and New Construction

When cutting a corridor through a heavily wooded area, trees must be protected from injury to the trunk, roots and canopy. Trees can be protected with silt fences or other temporary barricades throughout earth movement, shaping and seeding. Drip lines must be respected and used as limits of encroachment to reduce stress during construction. Densely tree-lined fairways, which were popular during a boom of golf course construction in the past, can seem claustrophobic to golfers. In this modern era of golf course design, architects are sensitive to the natural lay of the land and make use of contouring to create a natural rhythm.

Selective thinning within the existing wooded areas on the golf course should allow space for the trees to mature into their natural shapes. This process is tedious, and success is limited under the best of conditions. Once trees that supported other growth have been removed, the shock can be too much for the remaining plants. If these trees survive, their high canopies are ideal for golf courses.

The Root of the Problem

Tree roots can cause damage. Shallow feeder roots can be detrimental to healthy turf because of root competition for water and available nutrients. Golf car paths can bulge and crack from the roots of trees planted too close to the paths.

Surface roots from trees can cause players physical injury from club-head impact. Just ask Greg Norman or John Daly of the PGA Tour, both of whom suffered tree-related injuries and had to withdraw from major tournaments.

Mowing around irregular surfaces and over protruding roots is dangerous for crew members and detrimental to equipment. Tripping is common and driving golf cars over roots can be irritating as well. Trees should be located where they can exist in harmony with the surroundings and not be too close to play.

Irrigation Design

Ideally, an irrigation system should be designed to allow for the arc of water from each sprinkler head to extend to the drip line of trees on the golf course. Protect trees from potential injury by irrigating the roots instead of the trunk. The high pressure of irrigation systems on the golf course can damage bark and lower branches with the repetitive beating of the spray and the constant wetness.

The sound of water beating against a tree also can be quite annoying to homeowners in residential golf communities during the early morning hours when the golf course is being irrigated.

When installing golf course irrigation at a site with a

tree placed in or close to the fairway, the irrigation specialist should begin installing the heads around the tree and work both directions from that point. A triangle of irrigation heads should be placed around the tree. These heads need to be placed a sufficient distance from the trunk to allow for the stream of water to be on the downward arc if it must contact the trunk at all. Ideally, the ground containing the root systems of trees should be the only area watered by irrigation.

The out-of-bounds side of a golf car path, away from the centerline in the non-irrigated rough, is an ideal setting for trees. If the budget allows for a totally irrigated rough within the golf course design, the architect should consider a perimeter system with adjustable heads to regulate the amount of water in heavily shaded areas.

It Could Happen to You

Consulting with the architect may come in handy when you have to deal with design suggestions — including mass tree plantings — that may affect course playability and management.

For example, it's not too difficult to imagine a green committee chair unaware that misplaced trees may adversely affect IPM and total course conditioning, mentioning that golfers "really like those trees west of the 17th green." He or she adds that the local nursery has dogwood trees on

(Continued on Page 32)

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Trees—

(Continued from Page 31)

sale and that they'd look nice planted behind every green, "just like Augusta National." It's at these times when an architect can be a valuable third party.

You can suggest talking to a golf course architect and developing a master plan using your existing tree inventory. That way, the architect handles the objective analysis and evaluation of the course while interceding between the green committee, or management, and the golf course superintendent.

Plantings can be more intensive and varied near the clubhouse, within high-focus areas and adjacent to accessory structures where the presence of an ornamental-type tree gives added interest and frames the view.

If trees are not within your budget, invite the person who offers the suggestion to pay for new trees to be planted within the master plan. Suggest memorial plantings, which add a sentimental touch to remembering past club members.

What happens next depends on your situation:

Is There a Master Plan For the Golf Course?

The superintendent should inform the member, green chair or course pro about working within the architectural layout of the course as designed by the architect. Let them see the golf course plan during the next green committee meeting and proceed with implementation.

Remember, if the hole must have trees to develop integrity, it's not a good golf hole; don't plant trees — instead rework the basic architecture. The benefits of golf courses, according to GCSAA, the American Society of Golf Course Architects (ASGCA) and the USGA, are to maintain community greenspace, provide wildlife habitat, improve air quality, absorb and filter rain, cleanse runoff water, enhance human health and protect against erosion. Trees are a part of providing those benefits within the golf course environment.

If the Course Can't Afford The Master Plan in Its Entirety

Contact a member of the ASGCA for a consultation report and include the high-focus areas of the grounds and the problematic holes on the course. Trees can be sensitively integrated onto the course using your experience and that of a professional golf course architect.

If The Club Has a Tree Inventory Only

Interview golf course architects with regional experience and emphasis in planting plans for golf courses. They should have successful track records of implementing renovation master plans, as well as good communication skills.

If There Isn't a Tree Inventory

Begin to educate the decision-making constituents about the financial and agronomic benefits of a tree inventory and master plan that address the relationship of trees and

golf. An environmentally responsible facility will begin plans to cultivate the future of its trees. Waiting until the last minute or until problems get out of control has been the standard for the industry. Plans for the future begin now.

* * * *

(Editor's Note: Tamara Horvath is a Kansas City, Mo.-based horticultural consultant and writer. Craig Schreiner is a Kansas City-based golf course architect and a 1983 GCSAA National Scholarship winner. His firm has designed courses in North America, China and the Caribbean. This article was reproduced with permission from the January 1998 issue of *Golf Course Management Magazine*.)



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